THE RED-COCKADED WOODPECKER: NOTES ON LIFE HISTORY AND MANAGEMENT

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INTRODUCTION

The red-cockaded woodpecker was once a common bird in the mature pine forests of the Southeast. It lived from east Texas to Florida and north to Missouri, Kentucky and Maryland. Today, its range and population have been reduced through loss of habitat.

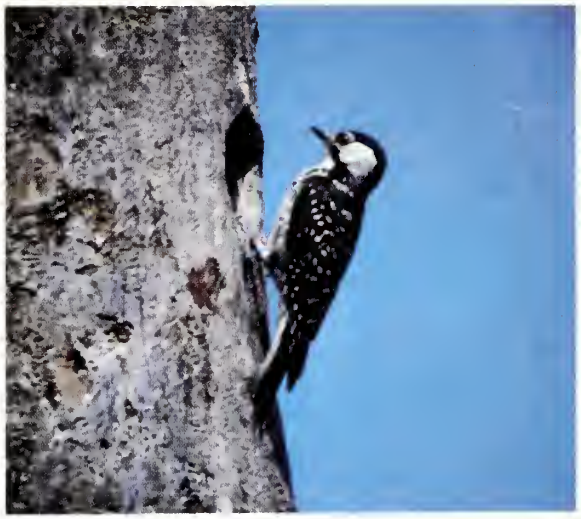
Unlike other woodpeckers, the red-cockaded roosts in cavities in live southern pines. It needs older pine trees for its cavities, and extensive pine and pine-hardwood forests to meet its foraging requirements. Much of the South has been cleared for agriculture or other incompatible uses. Much of the remaining pine forests are not suitable for the red-cockaded. Each year, more areas become unsuitable. Because of the drastic loss and continued decline of habitat, the bird is considered in danger of extinction.

In 1970, the red-cockaded was declared an endangered species. It now has the same protection given the better-known bald eagle and whooping crane. But protection alone is not enough. On Federal and State lands, forestry practices are giving the bird a better chance for survival by creating a favorable habitat. Other landowners can take positive steps to enhance its survival, especially if the red-cockaded already lives on their land. This publication describes the needs of the red-cockaded and outlines steps to aid the bird.

DESCRIPTION

The red-cockaded is slightly larger than a bluebird, about 7¼ inches (18.3 cm) long (figure 1). The back and top of the head are black. Numerous, small white spots arranged in horizontal rows on the back give a ladder-back appearance. The cheek is white. The chest is dull white with small black spots on the side. Males and females look almost alike, except males have a small red streak above the cheek. The red streak is rarely seen and then only with a powerful binocular in bright sunlight. Juvenile males have a small red patch on the very top of the head until fall.

All other southern woodpeckers of similar size have one or more of the following characteristics: conspicuous red on the head, a prominent white vertical streak on the back, a prominent white patch on the wing, or brown feathers.



LIFE HISTORY

Social Organization. – Among woodpeckers, the red-cockaded has an advanced social system. These birds live in a group called a clan. The clan may have from two to nine birds, but there is never more than one breeding pair. Young birds frequently stay with their parents for several months. The other adults are usually males called helpers. Some clans have no helpers, but others have as many as three. The helpers are typically the sons of the breeding male and can be from 1 to 3 years old. Young birds hatched in the spring disappear from the clan throughout the year, but a male sometimes remains with the clan to become a helper. The helpers assist in incubating eggs, feeding young, making new cavities, and defending the clan's area from other red-cockaded woodpeckers. A breeding male may live for several years. When he dies, one of his helper sons may inherit the status of breeding male.

The Colony. – A clan nests and roosts in a group of cavity trees called a colony. The colony may have one or two cavity trees to more than 12, but it is used only by one clan (figure 2). Cavities are made in live pines. Typically, within any colony, some cavities are still under construction (figures 3-5), some are finished and in use (figures 6, 7), and some have been abandoned (figures 9-13). In most colonies, all the cavity trees are within a circle about 1,500 feet (457 m) wide. In some colonies, all the trees are within 300 feet (9 m), but in others they may be ½ mile (.8 km) apart.

*See page 6

Each clan member tries to have a cavity for roosting. Only one bird roosts in a cavity. Birds without cavities in live trees often roost in scars on pine trees, in crotches between limbs or in cavities in dead trees. Red-cockadeds with cavities defend them from other red-cockadeds and other animals. Only the red-cockaded typically makes cavities in live pines, but 11 other birds, 5 mammals, 2 reptiles, and bees are known to use the cavities. Some animals use the cavity after it is no longer suitable for the red-cockaded. But others compete vigorously with the red-cockaded for its cavity. Some of the major competitors are the bluebird, red-bellied woodpecker, red-headed woodpecker, pileated woodpecker, and flying squirrel.

Nesting Behavior. – The red-cockaded woodpecker nests between late April and July. Only the breeding male courts and mates with the female. The female usually lays two to four eggs in the breeding male's roost cavity. Clan members take turns incubating the eggs during the day, but the breeding male stays with the eggs at night. The eggs hatch in 10 to 12 days. Nestlings are fed by the breeding pair and helpers. Adults bring food to the nest from up to 700 yards (640 m) away. Young birds leave the nest in about 26 days. Adults continue to feed the young after they leave the nest, but less so as summer progresses.

Feeding Behavior. – The clan spends much of its time looking for food as it travels about its territory. Most of the searching is concentrated on the trunks and limbs of live pine trees. There the birds scale the bark and dig into dead limbs for spiders, ants, cockroaches, centipedes, and the eggs and larvae of various insects. Repeated feeding visits are sometimes made to lightning-struck pines that are infested with beetles. The birds also spend time on cypress and hardwoods. Near farmland, they will feed on corn earworms. On occasion, they will eat fruits such as blueberry, sweetbay magnolia, wild cherry, poison ivy, and wax myrtle. They drink water from flooded holes in trees and from the ground.

The Territory. – The clan defends year round a territory surrounding the colony. Territories range from less than 100 acres (40.5 ha) to more than 250 acres (101 ha). The total area used by a clan can be as large as 1,000 acres (404.7 ha). A clan tries to keep other red-cockaded woodpeckers out of its territory, but will frequently trespass on its neighbors' territories. Defense can be mild encounters between clans, but at times fighting erupts with two opposing birds grasping each other's beak and falling to the ground.

Cavity Construction. – The red-cockaded woodpecker is the only bird that makes nesting and roosting cavities in live southern pines. Most other woodpeckers select dead trees or dead parts of live trees to make their cavities. These other birds generally make new cavities each year and many do so in less than 2 weeks. The red-cockaded takes months and even years to excavate a cavity. Compared to dead wood, the sapwood and heartwood of the living pine is indeed tough. The abundant resin or pitch flow that occurs once the sapwood is penetrated creates another barrier. Seldom is a cavity completed in 1 year and most take several years of work. Generally, clans have several cavities under construction at the same time with some closer to completion than others. Many cavities that are started are never completed. Once completed, a cavity is used for several years.

The most intensive work on cavities occurs in summer after the young leave the nest. A bird may spend an hour or more excavating. Although work occurs any time during the day, most is in the morning. As fall progresses the birds spend less time working on cavities, and work essentially stops in winter. Spring sees a renewed interest in cavity construction. At this time, some clans show more interest than others and some defer cavity work altogether until the young leave the nest. Most cavities are between 20 and 50 feet (6.1 and 15.2 m) above ground. A few have been found over 60 feet (18 m) and some as low as 4 feet (1.2 m). Generally, the cavity is below any live limbs. It is common to find a tree with several cavities, but the birds may not use all the cavities at a given time.

Before a cavity is completed it is called a start hole (figures 3-5). A start hole progresses from a thumbnail size area where the bark has been removed, to a tunnel 6 inches (15.2 cm) or more into the tree. The tunnel is excavated at an upward slope so the resin or pitch will drain from the hole. The heartwood doesn't have flowing resin. Once the birds have tunneled through the sapwood and into the heartwood a sufficient distance, they excavate downward forming a gourd-shaped chamber about 6 to 10 inches (15.2 to 25.4 cm) deep and 3 to 5 inches (7.6 to 12.7 cm) wide. A bird sometimes roosts in a start hole before the chamber is fully developed.

Cavity Maintenance. – Before the cavity is completed, the birds flake away the bark several feet above and below the cavity entrance. The smoother surface possibly makes it harder for snakes to reach the cavity. Scattered about the trunk near the cavity entrance, numerous small holes called resin wells are chipped through the bark (figures 5-8). Resin flow from these holes eventually coats the trunk with pitch. Birds regularly peck at resin wells to stimulate resin flow.

The cavity entrance would grow shut if the birds did not remove the growing tissue from around the hole. In time, the birds expose the sapwood for several inches around the entrance. This exposed area is called the plate (figure 7). Pitch from the plate and resin wells thoroughly coats the trunk. From a distance, the cavity tree looks like a candle

(figure 2). Some observers think these so-called candles help the woodpeckers find their cavities. Others think the conspicuous trees serve as a territorial warning to alien red-cockadeds. Another theory is that the resin deters predators – especially rat snakes. In one study, captive snakes actively avoided fresh resin and it appeared to be poisonous to them.

As long as a clan uses a cavity tree, the birds continue to scale the bark, chip the bark at the edge of the resin wells and plate, and enlarge the plate. On trees actively used for roosting and nesting, the pitch is clear and sticky, the freshly chipped bark around the resin wells and plate is reddish and the plate is light-colored. Once the birds stop using the cavity tree, the resin dries to a gray color, the plate becomes dull and weathered, and the bark at the edge of the resin wells and plate appears the same brownish color as the rest of the trunk (figures 9-13).

HABITAT REQUIREMENTS

Cavity Tree. – Red-cockaded woodpecker cavities have been found in longleaf, loblolly, shortleaf, pond, slash, pitch, and Virginia pines. Two cavities have been reported in cypress. Cavities are rarely found in trees as young as 30 to 40 years old and most cavity trees are twice that old. Studies from different parts of the South found the average cavity tree age ranged from 63 to 126 years for longleaf, 70 to 90 years for loblolly, 75 to 149 years for shortleaf, 62 to 130 years for pond and 70 years for slash pine.

The tree must have enough heartwood to contain the roosting chamber. A chamber in sapwood would fill with resin. Heartwood is quite hard, but a high percentage of cavities is found in pines infected with a heart rot fungus called red heart. This fungus weakens the heartwood and makes cavity excavation easier. Some cavity trees apparently do not have red heart, but these trees may have softer than average heartwood. It is not certain if the red-cockaded needs red heart in order to make a cavity in the average pine.

Active cavity with plate and resin wells.

Colony Site. – The colony site is the stand of trees containing and surrounding the cavity trees. A good colony site is a mature, park-like, pine stand with 50 to 80 square feet (4.6 to 7.4 m^2) of basal area per acre (figure 2). Few or no hardwood trees should be above 15 feet (4.57m) high. When the hardwood mid-story grows to the level of the cavities a high rate of cavity abandonment occurs, leading eventually to loss of the colony. Likewise sapling pines growing near the cavity trees can also cause abandonment. A few widely scattered hardwood trees, and shrubs below 15 feet (4.6 m) do not harm the red-cockaded and are beneficial to other wildlife. However, hardwood understories rapidly grow into hardwood mid-stories unless control measures are taken.

An important function of the colony site is to provide a source of new cavity trees. Cavity trees are generally used for several years, but on the average, from 4 to 9 percent die each year. In addition, other cavities become unusable by the red-cockaded. The colony site should be at least 5 to 10 acres (2 to 4 ha) to ensure cavity trees for the future.

The red-cockaded does not always have the chance to select good colony sites. Some sites that appear normal to the inexperienced eye are actually close to being abandoned. In seeking trees suitable for excavation, the bird often uses relict trees that were left as seed trees, or as culls, or to mark property boundries. Often, such sites lack a supply of future cavity trees. At other sites, the uncontrolled hardwoods rapidly crowd out the birds.

Foraging Habitat. – The best colony site is no good if an adequate foraging habitat is unavailable. Good foraging habitat consists of pine stands with trees 9 inches (22.9 cm) and larger in diameter at breast height (d.b.h.). The red-cockaded also forages in pole stands (4 to 9 inches d.b.h.), but little use is made of sapling stands (less than 4 inches d.b.h.). Clans regularly forage on pines scattered through hardwood stands, but pure hardwood stands are of little value to the woodpecker. The acreage of foraging habitat needed by a clan varies with the quality of the habitat. While 100 acres (40.5 ha) of mature pine is sufficient for some clans, where habitat conditions are not ideal, clans commonly forage over several hundred acres.

Clans sometimes continue to use a colony site when their territory has less than 100 acres (40.5 ha) of suitable foraging area. But, study suggests these clans have considerable difficulty raising young. It is not uncommon to find abandoned colonies surrounded by a lack of adequate foraging habitat. Control of mid-story hardwoods is essential in colony sites, but the red-cockaded commonly forages in pine stands with a well-developed hardwood mid-story.

RED-COCKADED HABITAT

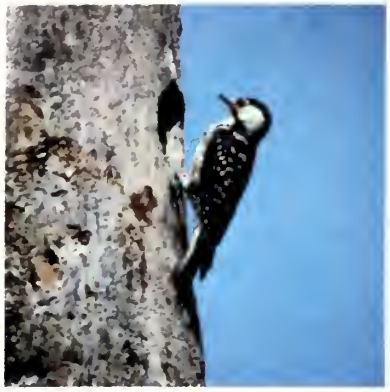


Figure 1.–Red cockaded woodpecker.

Red-cockaded cavities are made in live pines. Figures 1-17 show live pines. Cavity trees in open, mature pine stands are preferred (figure 2), but pine seed trees and relict pines in young stands are commonly used. In pine stands with hardwood midstories, active cavities tend to occur above the hardwood crowns and where hardwoods are sparsest. Hardwoods near the cavity typically lead to abandonment.

Figure 2.–Colony site. Note other cavity in center background.

CAVITIES UNDER CONSTRUCTION

Figure 3.–New start hole. Note 1-inch wide round hole and scaling.

Figure 4.–Advanced start hole, 2 inches wide. Note round hole, symmetrical excavation into sapwood and resin icicle.

Figure 5.–Cavity nearly completed. Note resin wells and icicle.

ACTIVE RED-COCKADED CAVITIES

Figure 6.–Cavity 2 inches wide with numerous resin wells.

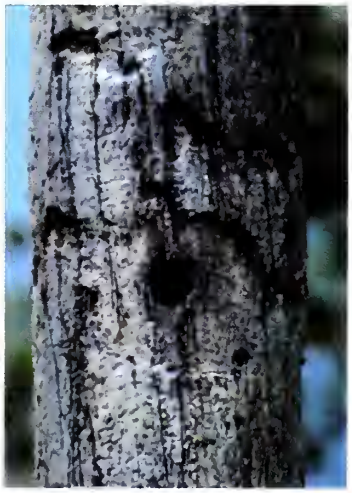


Figure 7.–Cavity 2 inches wide with plate and resin wells.

ACTIVE RESIN WELLS

Figure 8.–Close-up of resin well, 1-inch wide. Note red bark of active resin well.

Red bark on the edge of recently chipped resin wells and plate is a reliable sign a cavity is active (figures 5-8). A binocular is helpful. Caution: Look at the bark and not the resin – old resin sometimes looks red (figures 9, 10).

ABANDONED TREES

Abandoned cavity trees are clues active trees might be nearby. Resin dries and grays on abandoned trees. Bark at the edge of resin wells and plate turns brown or is hidden by dry resin. Red-cockaded woodpeckers rarely roost in abandoned cavities. Active and abandoned holes can occur on the same tree.

Figure 9.–Inactive start hole. Note dull sapwood and symmetrical hole. Red color is dried resin.

Figure 10.–Abandoned cavity. White resin covers resin wells and plate.

Figure 11.–Abandoned cavity. Note dull bark on resin wells and edge of plate. Reddish color on plate is dried resin.

Figure 12.–Enlarged cavity 5 inches wide. Note extensive coverage of old resin.

Figure 13.–Enlarged cavity 5x8 inches. Note old plate and resin wells.

Figure 14.–Yellow-bellied sapsucker holes ¼-inch wide.

Figure 15.–Asymmetric feeding hole of pileated woodpecker.

Figure 16.–Branch hole. Note lack of icicle.

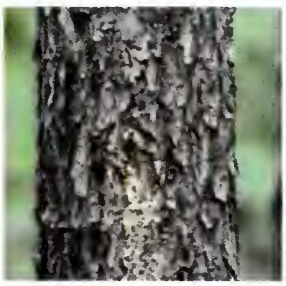


Figure 17.–Asymmetric tree wound with sparse resin flow.

MISTAKEN FOR RED-COCKADED

If a hole does not have one or more of the following it is likely not to have been made by a red-cockaded: symmetrical hole, scaling, icicle, resin wells, or plate. Look for positive signs of red-cockaded activity. Binoculars are often needed. Sapsucker holes are smaller and more regularly spaced than resin wells (figure 14). Pileated woodpecker feeding holes are generally asymmetric (figure 15) and, if they penetrate sapwood, are tapered and ragged. Resin flow is light and scattered compared to distinct icicle of start holes (figures 3-5). Pileated work is common in pine stands with dense hardwood cover. Branch holes lack an icicle (figure 16). Tree wounds are asymmetric (figure 17). **Caution:** Sapsucker holes sometimes occur on red-cockaded trees and red-cockadeds can excavate cavities through branch holes. In both cases, positive sign of red-cockadeds is present.

Nontheless, the highest populations of the bird are on areas with active, prescribed burning programs for the control of hardwoods in pine stands. Also, territories tend to be smaller in areas with hardwood control.

MANAGEMENT SUGGESTIONS[1]

Governing Factors. – The potential for managing privately-owned forests to provide a favorable habitat for the red-cockaded woodpecker depends on (1) goals of the owner (2) current condition and natural capabilities of the land (3) size of the forest (4) forest conditions on adjacent land (5) occurrence of the red-cockaded on the owner's land and adjacent lands.

Landowners who have a red-cockaded colony can do much to enhance its survival regardless of the size of their property. But, because the birds forage over large areas, forest conditions on adjacent land may ultimately determine the fate of a colony. On larger forests, particularly those 200 acres (80.9 ha) or bigger, the bird can be maintained with greater assurance. Each individual colony is important to the survival of the species, but large ownerships of several hundred or thousand acres have the potential of sustaining significant populations of this endangered species. Land that has little or no pine forests has little potential as a red-cockaded woodpecker habitat. On areas without red-cockaded woodpeckers, but with pine forests, improvement of the habitat may encourage the red-cockaded to move into the area.

Objectives. – A successful management plan for the red-cockaded woodpecker must do five things: (1) retain existing cavity trees (2) provide trees for new cavities (3) provide adequate foraging habitat (4) control hardwoods in the colony site (5) provide future colony sites.

Colony Site. – Defer harvesting of existing colony sites. If the colony is in a larger stand that will be harvested, designate an uncut 200-foot (61 m) buffer zone around each cavity tree. Leaving only the cavity trees is not adequate, as the buffer is needed to provide replacement cavity trees. Do not isolate colony sites from foraging stands of pole size and larger pines. The colony site should be surrounded by or directly adjacent to foraging stands.

Control of hardwoods in the colony site is vital. Do not allow hardwoods to exceed 15 feet (4.6 m) or so in height, especially within 50 feet (15.2 m) of cavity trees. In colony sites lacking past hardwood control, it may be necessary to remove hardwoods by cutting. Prescribe burning, when properly applied, is an effective means of controlling small hardwoods. When using fire, rake around the base of the cavity trees to remove litter and resin, otherwise the tree may catch fire and destroy the cavity.

Thin stands containing colony sites back to 50 to 80 square feet (4.6 to 7.4 m^2) of basal area per acre. Leave the older trees for future cavity trees. Unless a safety hazard, do not remove dead or abandoned cavity trees as other animals may use them instead of the good cavity trees.

In colony sites infested with southern pine beetles, the infested trees, except cavity trees, may be cut and removed, burned or sprayed with an approved pesticide. Do not use pesticides (such as organophosphates) toxic to vertebrates.

Foraging Areas. – Manage the available acreage as a foraging habitat. Favor pine stands on suitable sites. Plant pines at a 10x10 foot or 12x12 foot (3x3 m or 3.7x3.7 m) spacing to aid rapid stand development. Birds continue to use seed tree areas for foraging until seed tree removal. Regeneration areas of 10 to 30 acres (4 to 12 ha) have less impact on the bird than larger ones. Avoid isolating colony sites from foraging areas when regenerating stands. Thinning of sapling and pole stands improves diameter growth and opens up stands to a condition more suitable to the woodpecker. Control hardwoods by prescribed burning.

Rotation Age. – In general, the longer the rotation age, the greater the opportunity the red-cockaded has to maintain existing colonies and to create new ones. The minimum rotation age necessary to provide an adequate number of cavity trees to sustain a viable population of Red-cockadeds is not known. As a safe minimum, the National Recovery Team recommends 100-year rotations for longleaf and 80-year rotations for other pines. Some opportunity for cavity replacement is provided by shorter rotations of 80 years for longleaf and 70 years for other pines, but it is not certain if these rotations can supply an adequate number of cavity trees. When it is not feasible to have long rotations over the entire ownership, leaving small, scattered stands of older pines will benefit the bird.

THE AUTHORS

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[1]The suggestions are based upon those recommended by the National Recovery Team for the Red-cockaded Woodpecker.

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